The DRAFT 2016 Iowa List of Clean Water Act Section 303(d) Impaired Waters

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Summary: Iowa's draft 2016 Section 303(d) list of impaired waters contains 608 waterbodies with a combined total of 818 impairments. This draft list equates to Category 5 of Iowa's 2016 Integrated Report. The list includes 513 stream/river segments, 71 lakes, 7 segments of three federal flood control reservoirs, and 17 wetlands. The list is a subset of the 1,378 waterbodies assessed by Iowa Department of Natural Resources (IDNR) staff for support of their designated beneficial uses (Table 1) as described in the _Iowa Water Quality Standards_ as part of the Clean Water Act Section 305(b) reporting for the 2016 cycle. Impairments are identified for all classes of beneficial uses (primary contact recreation, aquatic life, drinking water, fish consumption, and general uses) designated for Iowa surface waters. The total number of impaired waters in Iowa's draft 2016 Integrated Report is 750, with 608 Section 303(d) waters [Category 5: impaired and TMDL needed] and 142 waters in Category 4 [impaired but TMDL not required]. There are a total of 1,096 impairments when Categories 4 and 5 are combined. Similar to past listing cycles, the most frequently identified causes of impairment in streams and rivers are indicator bacteria (_E. coli_), biological, and fish kills: these three causes account for 84% of the 813 stream/river impairments. For lakes, the most commonly identified impairments remain algal turbidity, non-algal turbidity (suspended sediment), and indicator bacteria (_E. coli_) with these three causes accounting for 76% of the 283 lake/reservoir impairments (see Figure 1, Figure 2 and Figure 3 or the 2016 Assessment Summary in ADBNet).

Federal Requirements for water quality reporting and impaired waters listing: The Federal Water Pollution Control Act (commonly referred to as the Clean Water Act (CWA)) requires each state to develop a program to monitor the quality of its surface waters (streams, lakes, and wetlands (=waterbodies)). Section 305(b) of the CWA requires states to prepare, every two years, a report that describes, based on the monitoring data available, the status of water quality and the extent to which state waters meet goals of the Act. Section 303(d) of the CWA requires each state, "from time to time", to list its waters for which effluent limitations are not sufficient to meet state water quality standards. In federal regulations for implementing Section 303(d), U.S. EPA has defined "from time to time" to mean April 1 of even-numbered years, which coincides with the deadline for Section 305(b) reporting. Beginning with the 2004 water quality reporting cycle, U.S. EPA recommended that states provide a single water quality monitoring and assessment report—the Integrated Report—that combines the water quality reporting requirements of Section 305(b), the impaired waters listing requirements of Section 303(d) and the lakes reporting requirements of Section 314 of the Clean Water Act. This "Integrated Report" is composed of five categories that are designed to give the public and other stakeholders a comprehensive summary of the water quality status in the state (Table 1). According to U.S. EPA's guidelines, water quality problems identified in the Integrated Report should be emphasized and reflected in the state's water quality management plan and annual work programs under Sections 106, 205(j) and 319 of the Clean Water Act.

Iowa's Water Quality Monitoring Programs: The current IDNR surface water monitoring network consists of approximately 60 stations mainly located on the larger interior rivers with a few stations located on larger streams. In addition, swimming beaches at 35 state-owned lakes are sampled for indicator bacteria (_E. coli_) weekly from April through October. During the period 2010-2014, 131 Iowa lakes were sampled during summer seasons either by Iowa State University or the State Hygienic Laboratory (SHL) as part of the IDNR-sponsored statewide lake monitoring program. Approximately 70 stations on smaller rivers and streams are sampled annually by SHL for fish and macroinvertebrates as part of IDNR's biological monitoring program. The IDNR conducts annual monitoring of toxic contaminants in fish from approximately 35 sites on Iowa's rivers and lakes. The IDNR also uses data from monitoring networks operated by the Corps of Engineers, U.S. Geological Survey, and municipal water utilities (e.g., Des Moines, Cedar Rapids and the Rathbun Rural Water Association). Results of fish kill investigations are also used to develop water quality assessments and to identify impairments.

Qualifiers: The list of impaired waters is only as inclusive as the various water quality (WQ) monitoring networks in Iowa. In general, when the amount of monitoring data increases, the number of waters on the Impaired Waters list also increases. The identification of impairments is also strongly tied to the state's water quality standards; therefore, because Iowa does not yet have numeric WQ criteria for nutrients or sediment/siltation, identification of such impairments is relatively rare. Additionally, because Iowa's WQ Standards also lack criteria for turbidity, any lake or wetland impairments attributed to algae (chlorophyll) or non-algal turbidity are based on violations of the state's narrative standards protecting against "aesthetically objectionable conditions". Eventual adoption of numeric criteria for nutrients, chlorophyll, and/or turbidity will likely result in a substantial *increase* the number of waterbodies on Iowa's future lists of impaired waters.

Perspective on the meaning of "impairment": Much confusion exists regarding the meaning of "impairment" as used for Clean Water Act Section 303(d) listing. In terms of water quality condition, "impairment" is not a "one size fits all" concept. The degree of water quality impairment ranges from slight to severe. Severe water quality problems, although rare, do continue to occur in Iowa. Most of the impairments on Iowa's draft list of impaired waters, however, do not indicate severely or grossly polluted conditions. Often, the difference between assessing a waterbody as "impaired" versus "fully supported" can come down to contaminant levels in only one of 36 monthly samples or the absence of a few key aquatic species in a stream. Iowa's water quality standards and numeric water quality criteria—which are the basis for identifying impairments—are designed to be protective of the beneficial uses designated for Iowa's streams, rivers, and lakes. These criteria are set to warn of potential water quality problems well before anything approaching "grossly polluted conditions" occurs. Many waters assessed as "impaired" for aquatic life uses often continue to support a moderately healthy and diverse aquatic community. Also, the designated recreational uses of many Iowa waters—especially rivers and streams—are impaired by high levels of indicator bacteria, but reports of waterborne illness related to these high levels of bacteria have been extremely rare in Iowa over the last 40 years.

Why does the number of impaired waters in Iowa continue to increase? A state's Section 303(d) list of impaired waters is, in part, an accumulation of impairments identified in past listing cycles. Once added to a state list, the impairment is likely to remain on the list. In general, impairments are identified faster than impairments are removed through the TMDL process or due to water quality improvement. Thus, number of impaired waters on state lists tends to increase over time. Also, as more state waters are monitored over time, the number of impairments continues to increase. While states can easily add new impairments, U.S. EPA carefully scrutinizes any state proposal to remove (de-list) impairments from a Section 303(d) list and sometimes rejects state recommendations for de-listing. In addition, a large proportion of impairments (bacteria and biological impairments) are related to nonpoint sources of pollution. Unless a state has authority and the means to reduce levels of nonpoint source pollution, the NPS-related impairments will likely continue to reside on the state's list of impaired waters.

Why is the number of impaired waters on the 2016 list only slightly greater than that on the 2014 list? The percent increase between Iowa's 2012 impaired waters list and the 2014 list was 17%. The number of impaired waters on Iowa's draft 2016 Section 303(d) list (608) shows only a 2% increase over the number on Iowa's final/approved 2014 list (571) (Figure 4). The decline in the percent increase between the 2014 and 2016 listing cycles is due primarily to the lack of additional monitoring programs in small watersheds which tends to generate large numbers of impairments for indicator bacteria on small streams.

Removal of impairments: According to U.S. EPA regulations, impairments can only be removed from a state list for specific reasons, including (1) more recent data showing that the impairment no longer exists, (2) discovery of an error in the data or rationale for the original listing and (3) preparation and approval of a total maximum daily load (TMDL) that identifies sources of pollutant loadings and reductions in loadings necessary to fully attain applicable water quality standards. A primary mechanism for removing waters from Iowa's list of impaired waters has been preparation and U.S. EPA approval of TMDLs. Category 4a of the draft 2016 Integrated Report consists of 130 waterbodies that were previously on Iowa's lists of impaired waters (IR Category 5) but that now have TMDLs approved for their impairments. Fifty-six impairments are proposed for removal from the final/approved 2014 list due to one of the following reasons: new data (24), errors in the original assessment (16), recovery of fishkill streams (9), preparation of TMDLs (5) and legal actions against parties causing fish kills (2) (see Figure 5 and Figure

6). Review of recent (2010-14) monitoring data for Iowa's surface waters suggests neither general improvement nor decline in the status of water quality statewide. Table 2 presents a brief summary of the impairment status of the streams, river, and lakes assessed for Iowa's 2016 Integrated Reporting cycle.

The Integrated Report Format

As specified in U.S. EPA's guidelines for the 2016 water quality reporting and impaired waters listing cycle, the integrated report consists of five categories:

- Category 1: All designated uses are met.
- Category 2. Some of the designated uses are met, but there are insufficient data to determine if the remaining designated uses are met.
- Category 3: Insufficient data to determine whether any designated uses are met.
- Category 4: Waterbody is impaired or threatened but a TMDL is not needed.
- Category 5: Waterbody is impaired or threatened and a TMDL is needed.

In their guidance to states, U.S. EPA has added the following Integrated Report subcategories:

- Category 4a: All TMDLs need to result in attainment of all applicable water quality standards have been approved or established by EPA.
- Category 4b. Other required control measures are expected to result in the attainment of water quality standards in a reasonable period of time;
- Category 4c: The impairment or threat is not caused by a pollutant.

The U.S. EPA guidelines allow states to create additional subcategories in order to refine the reporting process. In order to better track the attainment status of Iowa waterbodies, the following subcategories have been created by IDNR:

- Category 3b: Insufficient data to determine whether any designated uses are met but at least one use is potentially impaired.
- Category 4d: Waterbody assessed as "impaired" due to a fish kill where enforcement action was taken to address the source of the kill: no TMDL required.
- Category 5b: Impairment is based on results of a fish kill investigation or biological monitoring where specific causes and/or sources of the impairment have not yet been identified.
- Category 5p: A presumptively-applied use is impaired (most often applied to bacterial impairments of the presumptively applied Class A1 (primary contact recreation) use).

Iowa's List of Waters in Need of Further Investigation:

The list of waters in need of further investigation (WINOFI), as required by Iowa's "credible data law", is comprised of those waterbodies assessed as "potentially impaired" and placed in IR category 3b. As stated in the rationales for subcategory 3b above, the assessment of any impairment in these waterbodies was based on less than complete information that suggests only a potential impairment. Thus, the assessments are of relatively low confidence and are not appropriate for addition to Iowa's impaired waters list. Iowa's draft 2016 list of waters in need of further investigation contains 301 waterbodies (Table 2).

Table 1. Summary of the number of waterbodies in each category of Iowa's draft 2016 integrated Section 305(b) / Section 303(d) report. The 608 waterbodies in Categories 5a, 5b, and 5p comprise Iowa's draft 2016 Section 303(d) list; the 301 waterbodies in Category 3b comprise Iowa's draft list of waters in need of further investigation.

Integrated Report Category	Category Description	Number of Waterbodies
1	All designated uses met.	9
2a	At least one designated use met; insufficient data to determine whether other uses are met.	318
3a	Insufficient data to determine whether any designated uses are met.	1,103
3b	Insufficient data to determine whether any designated uses are met but at least one use is potentially impaired based on an "evaluated" assessment.	301
4a	All TMDLs need to result in attainment of all applicable water quality standards have been approved or established by EPA.	85
4b	Other required control measures are expected to result in the attainment of water quality standards in a reasonable period of time; TMDL not required.	0
4c	The impairment or threat is not caused by a pollutant; TMDL not required.	22
4d	Waterbody assessed as "impaired" due to a fish kill where enforcement action was taken to address the source of the kill: TMDL not required.	34
5a	Waterbody is impaired or threatened and a TMDL is needed.	257
5b	Impairment is based on results of biological monitoring or a fish kill investigation where specific causes and/or sources of the impairment have not yet been identified.	158
5p	A presumptively applied use is impaired.	193

Table 2. Summary of the assessed lake and stream/river waterbodies for Iowa's draft 2016 305(b)/303(d) cycle according to general water quality condition (good, potentially impaired, impaired). Note: each assessed waterbody may have more than one impairment.

Waterbody Type	Number of WB assessed:	Good water quality: Categories 1 & 2a:	Potentially impaired: Categorie 3b (WINOFI):	Impaired: Categories 4 & 5:
Streams and Rivers	1044	201 (19%)	238 (23%)	605 (58%)
Lakes and Flood Control reservoirs	204	59 (29%)	28 (14%)	117 (57%)
Wetlands	130	67 (52%)	35 (27%)	28 (22%)

Web links:
- ADBNet: Iowa's Section 305(b) assessment database: http://programs.iowadnr.gov/adbnet.
- Iowa Water Quality Standards: https://www.legis.iowa.gov/DOCS/ACO/IAC/LINC/Chapter.567.61.pdf.
- Assessment and Listing Methodology: http://www.iowadnr.gov/Portals/idnr/uploads/watermonitoring/impairedwaters/2016 Iowa Draft Methodology.pdf.
- EPA Clean Water Act Section 303(d): Impaired Waters: https://www.epa.gov/tmdl#reporting
- EPA guidelines for Integrated Reporting : https://www.epa.gov/tmdl/integrated-reporting-guidance.
- EPA regulations: https://www.ecfr.gov/cgi-bin/text-idx?SID=93cf35a4997699004332623327ea83ea&mc=true&node=se40.24.130_17&rgn=div8
- Federal regulations for implementing Section 303(d): https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=8bdafc2563e4fe48eb3cf36f106d6366&mc=true&n=pt40.24.130&r=PART&ty=HTML#se40.24.130_110
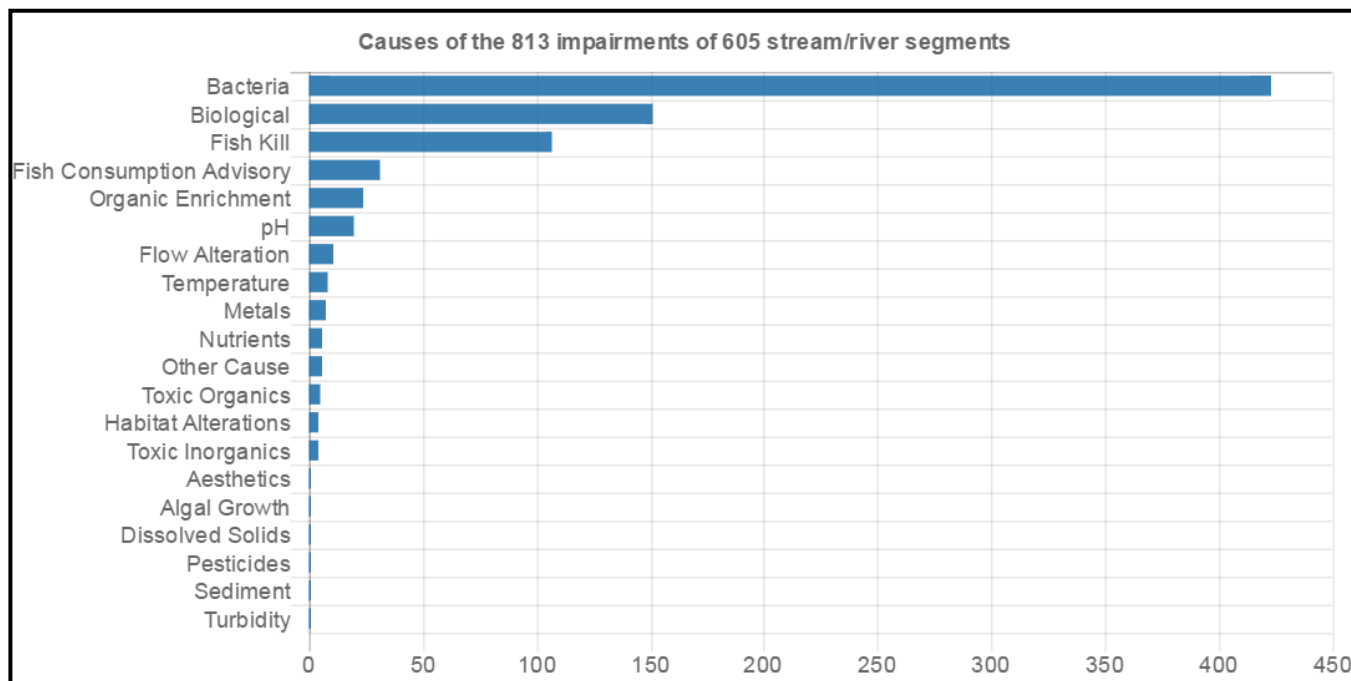
Figure 1. Causes of the 813 impairments in the 605 stream/river segments in Categories 4 & 5 (impaired waters) of Iowa's 2016 Draft Integrated Report.
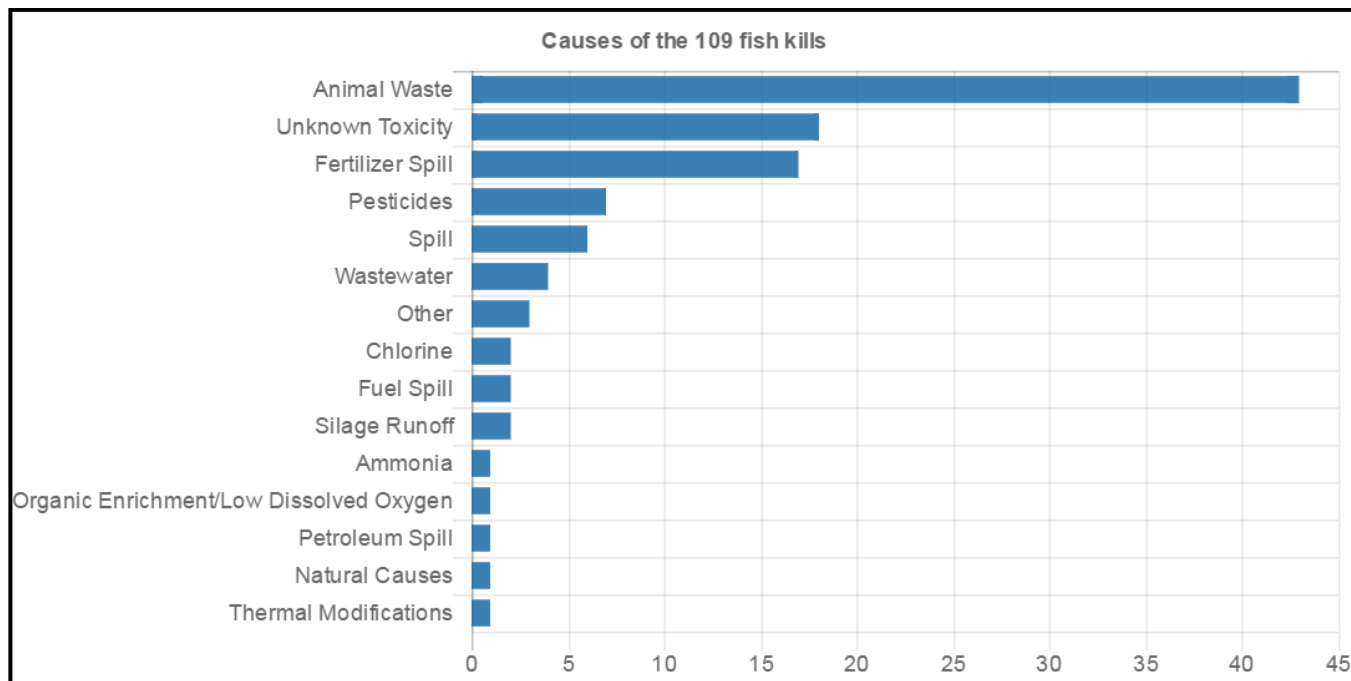

Figure 2. Causes of the 109 fish kill impairments in rivers & lakes in Categories 4 & 5 (impaired waters) of Iowa's Draft 2016 Integrated Report.
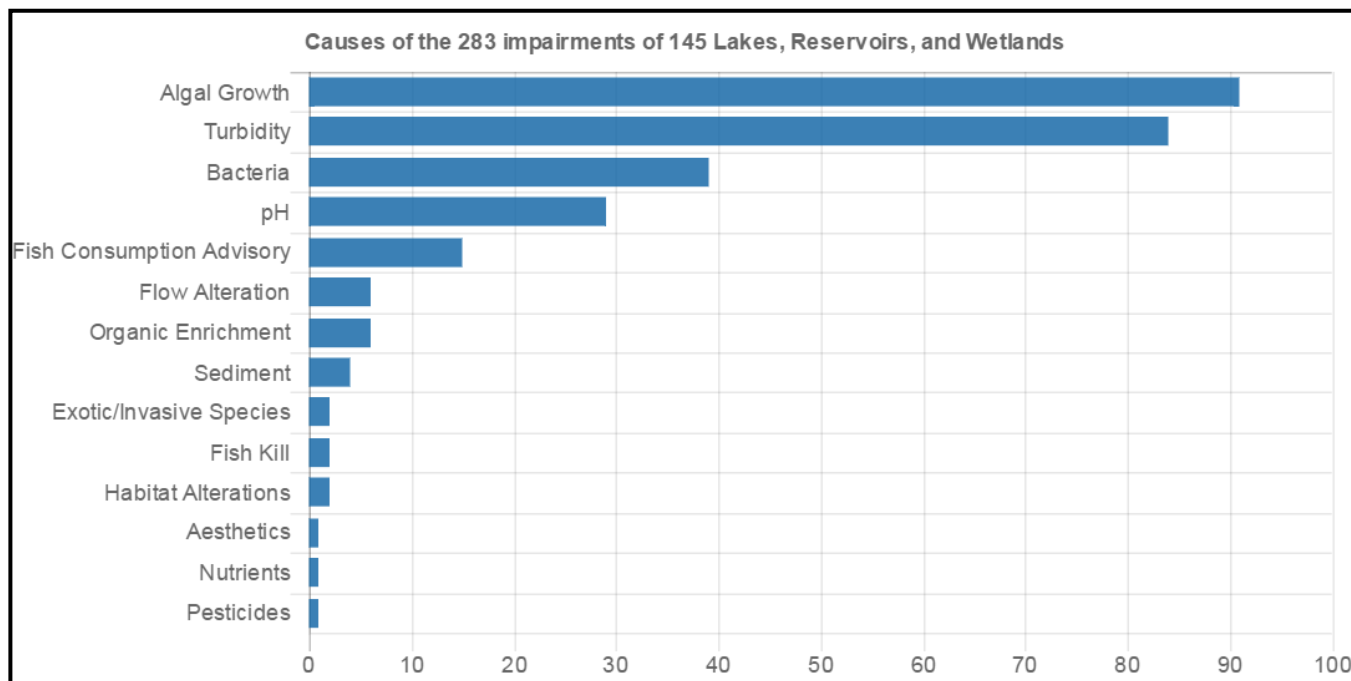
Figure 3. Causes of the 283 impairments in the 145 lake/reservoir waterbodies in Categories 4 & 5 (impaired waters) of Iowa's Draft 2016 Integrated Report.
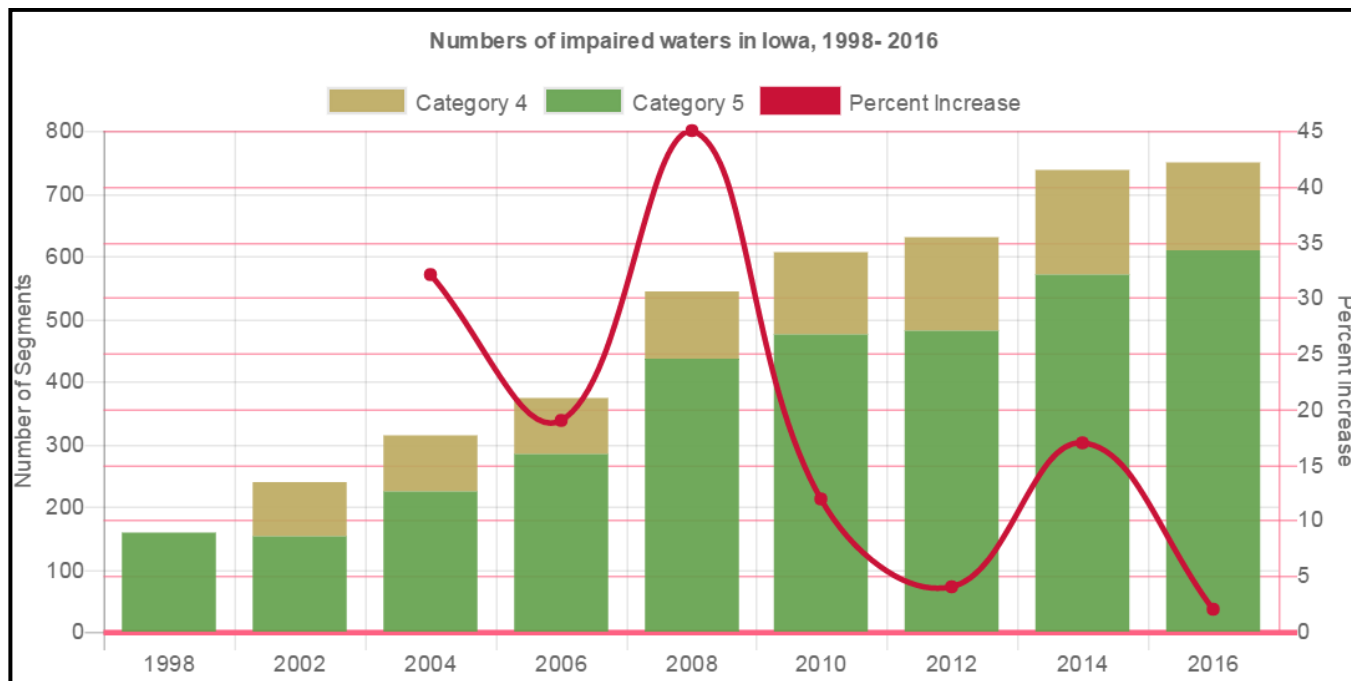
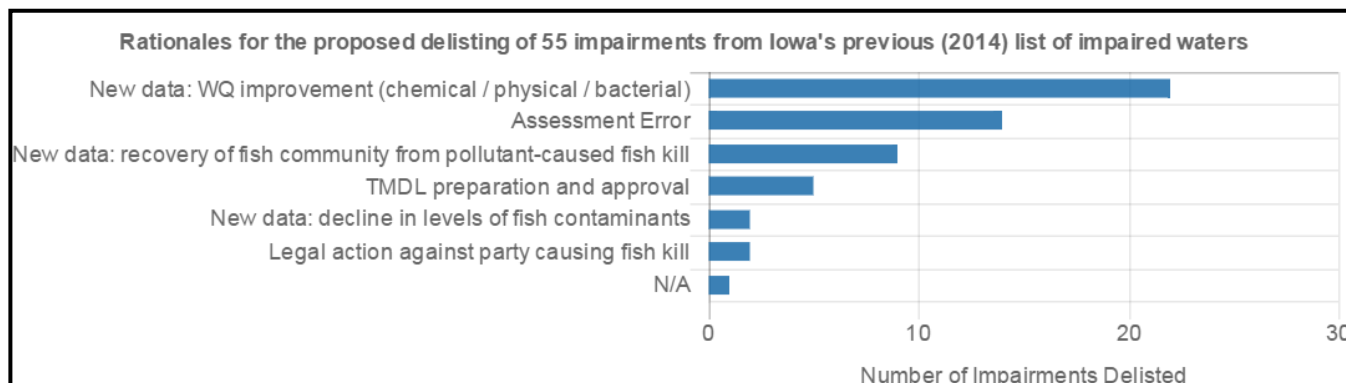

Figure 4. Numbers of impaired waters in Iowa, 1998-2016

Figure 5. Rationales for proposed removal (de-listing) of 55 waters that were on Iowa's previous (2014) list of impaired waters (IR Category 5).
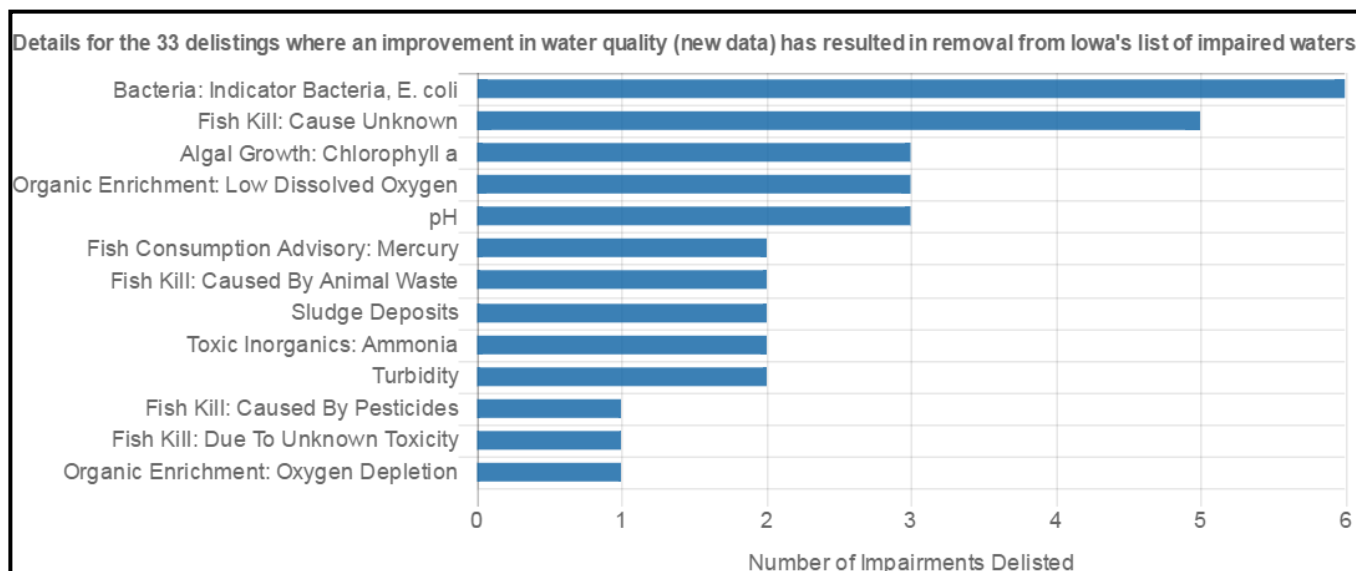

Figure 6. Details of the 33 impairments in Figure 6 proposed for removal from Iowa's previous (2014) list of impaired waters due to new data: water quality improvement.

Iowa's 2016 Section 303(d) list is the eighth to be developed under Iowa's Credible Data Law. This law requires that listing decisions be based on scientifically valid chemical, physical, or biological data collected under a scientifically accepted sampling and analysis plan, including quality control and quality assurance procedures. The Department believes that this law has been implemented in conjunction with the federal listing requirements such that all readily available and existing water quality related data and information have been used for list development.

Iowa's draft 2016 Section 303(d) list (Category 5 of the Integrated Report) was prepared according to IDNR's revised Assessment and Listing Methodology. The list contains 608 waterbodies with a total of 818 impairments. There were 571 waterbodies with 754 impairments on Iowa's 2014 final EPA-approved list.